NORDAQ ENERGY, INC.

"KNOWLEDGE AND VISION FOR ALASKA"

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OIL AND GAS

NordAq Energy, Inc.
Shadura 3D Seismic Survey
Kenai National Wildlife Refuge

Plan of Operations

October 25, 2012

Version 2

NORDAQ ENERGY, INC.
KNOWLEDGE AND VISION FOR ALASKA

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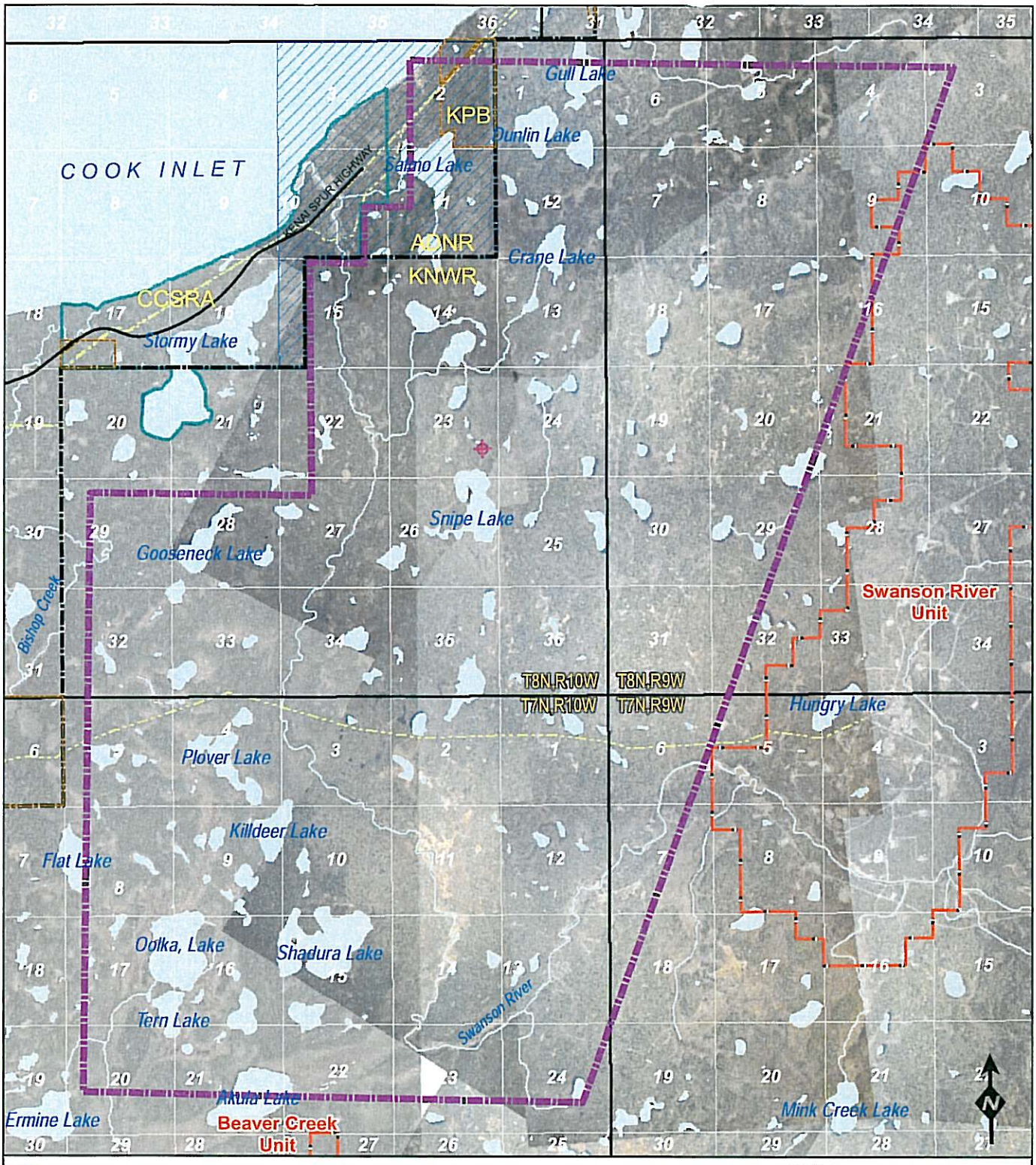
1. Project Description

NordAq Energy, Inc. (NordAq) proposes to conduct a 49-square mile, three-dimensional (3D) seismic acquisition program on the Kenai Peninsula in the northern portion of the Kenai National Wildlife Refuge, Alaska (Refuge) during the winter of 2012-13. The proposed survey area is located west of the Swanson River Oil and Gas Unit and east of the Cook Inlet coastline (Figure 1). A small portion of the survey will be conducted outside of the Refuge boundary on Kenai Peninsula Borough and the State of Alaska (Figure 2) owned lands. The seismic survey will be conducted primarily on undisturbed land on Cook Inlet Region, Inc. (CIRI) lease holdings and adjacent state acreage. This survey data will provide a three-dimensional picture of the subsurface to better define drilling targets, and define the hydrocarbon potential of deeper horizons.

This seismic survey will be conducted using heliportable drilling units and autonomous (cable-free) receivers that will allow for minimal intrusion and vegetation clearing of the surveyed area. In contrast, traditional seismic methods in Alaska include use of tracked vehicles, tethered receivers, and extensive line clearing. Heliportable seismic survey methods are used commonly in remote, roadless areas with difficult terrain. Survey data will be acquired by sequentially deploying seismic sources and crews via helicopter, detonating charges one at a time across the survey area, recording returned signals, and retrieving the autonomous receivers.

The seismic survey is planned for winter months when the presence of migratory animals in Alaska is low. The survey will be conducted under frozen conditions and completed by breakup. Prior to snow fall, all baseline environmental field work will be completed (as described below).



Program Area
ADNR Active State Lease
Oil & Gas Unit Boundary
Kenai National Wildlife Refuge
Captain Cook State Recreation Area
Shadura #1 Exploratory Well
Roads
Existing Pipelines

SCALE:
0 0.5 1 2 Mi
0 0.5 1 2 Km

Projection: State Plane Alaska Zone 4 (feet), NAD83
Seward Meridian

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KNOWLEDGE AND VISION FOR ALASKA

ALASKA
Project Location

NORDAQ SHADURA 3D SEISMIC SURVEY
PLAN OF OPERATIONS

PUBLIC VICINITY MAP - DRAFT

FIGURE: 1

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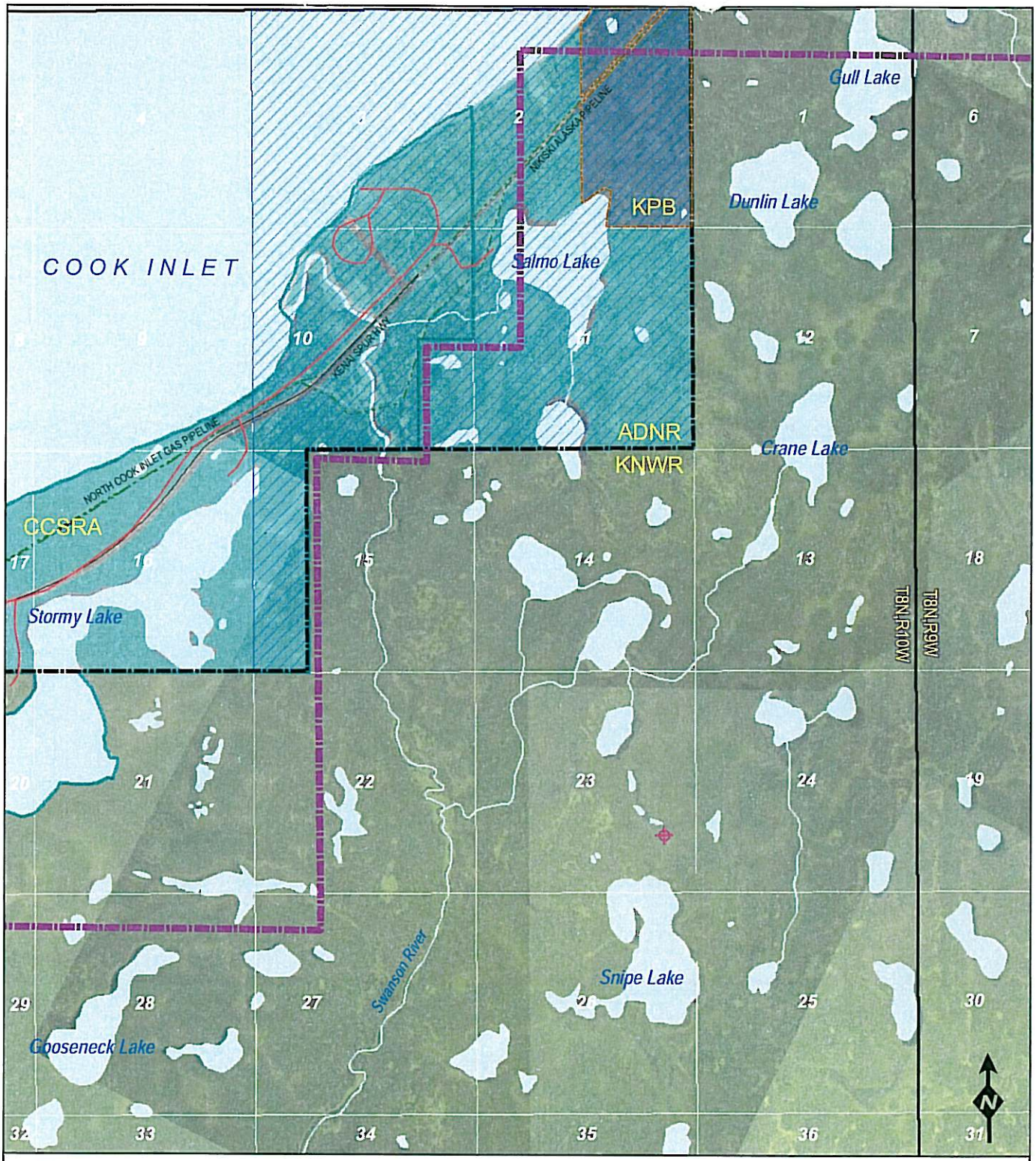
COOK INLET
Gull Lake
Dunlin Lake
Salmo Lake
Crane Lake
Stormy Lake
Snipe Lake
Swanson River
Gooseneck Lake
KPB
ADNR
KNWR
CCSRA
NIKISKI ALASKA PIPELINE
KENAI SPUR HWY
NORTH COOK INLET GAS PIPELINE
T8N,R10W
T8N,R9W
N
Program Area
ADNR Active State Lease
Shadura #1 Exploratory Well
Existing Pipelines
Roads
Secondary Road
Kenai Peninsula Borough
Federal Land
State Land
SCALE:
0 0.25 0.5 1 Mi
0 0.25 0.5 1 Km
Projection: State Plane Alaska Zone 4 (feet), NAD83
Seward Meridian
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KNOWLEDGE AND VISION FOR ALASKA
ALASKA
Project Location
NORDAQ SHADURA 3D SEISMIC SURVEY
PLAN OF OPERATIONS
PUBLIC VICINITY
MAP DETAIL- DRAFT
FIGURE:
2
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2. List of Authorizations Required

Permits will be required from the following agencies:

Agency	Authorization
US Department of the Army, Corps of Engineers	Nationwide 6 Permit for Survey Activities
US Fish and Wildlife Service	Special Use Permit
US Fish and Wildlife Service	Environmental Assessment
US Fish and Wildlife Service	Cultural Resources Clearance
Alaska Department of Natural Resources, State Historic Preservation Office	Cultural Resources Clearance
Alaska Department of Natural Resources, Division of Oil and Gas	Miscellaneous Land Use Permit for Geophysical Exploration
Kenai Peninsula Borough (KPB)	Easement Access for KPB parcel

3. Project Schedule/Timelines and Milestones

The project is scheduled as follows:

Generalized Activity	Start	End
Planning and Permitting	August -September 2012	November 2012
Drilling and Data Acquisition	December 2012	April 2013
Post-Survey Inspection & Restoration	Late March 2013	No later than October 2013

4. Survey Operations

The 3D seismic survey will be conducted in four basic segments. They are (a) pre-plot planning, surveying, and permitting; (b) source and receiver deployment and retrieval; (c) data acquisition and recording; and (d) survey completion, inspection, monitoring, and restoration. Operations that will be performed in each segment are detailed below.

Approximately 70 to 80 persons will be employed on the survey. Twenty of these will be dedicated to drilling operations. Two teams will lay out equipment and two teams will retrieve. A single daytime crew shift will conduct the survey alleviating the need for nighttime operations. The survey is anticipated to take 60 to 90 days to complete.

4.1 Pre-plot Plan Survey

Prior to snow fall, all baseline environmental fieldwork will be completed. All hazards and no-surface entry restrictions will be identified and marked, and buffer zones will be created using Global Positioning System (GPS) equipment. Buffer zones will be plotted into the navigation system to protect and avoid any identified historic and cultural resources, fish habitats, riparian zones, occupied bear dens, and surface structures, including utility lines if any.

4.2 Source and Receiver Deployment and Retrieval

NordAq will use a cable-free recording system (Autoseis Nodal cable-free recording boxes and Sercel SG-10 geophones with snow plates). This system will eliminate the need for signal transmittal cables and battery packs. The receivers will be placed into position by hand and held in place by a small spike or snow plate. No river or stream crossings with cables or receivers will occur. Each unit has its own charging station located in a special-built trailer for downloading and charging. A small (10 kV) portable generator will provide electric power for the recording shack and will consume about 5 gallons of gasoline per day. Approximately 8,205 autonomous receiver nodes will be placed throughout the survey area.

Most source locations can be accessed without vegetative clearing. Source charge locations in dense trees will be cleared with chain saws and hand tools to create an approximate 10-ft diameter "sky hole" to allow lowering, positioning, and hoisting the drilling and support units. We estimate 20 percent of the source locations will require sky holes. There will be no clearing in sparsely treed or treeless areas. Operations will avoid dense areas of trees and reposition source points where practicable.

Portable drilling units and seismic crews will be deployed by helicopter to operate the units, and deploy and retrieve the receiver nodes. The drill rig and support equipment required to drill each source energy shot hole (shot hole) will be moved between target locations by a helicopter in two sling load lift trips (picks). The drilling units will be left in the field overnight to reduce total fuel consumption, helicopter flight time, labor costs, emissions, noise, and risk of accidents. No overland vehicles will be employed, except possibly after the US Fish and Wildlife Service (Service) opens the Refuge to snow machine travel.

The shot holes will be drilled to a depth of 25 feet, approximately 4-inches in diameter, and will be loaded with a 2.2 lb. (1 kg) explosive charge (source charges). Prior to drilling, a barrier will be placed on the ground to aid in returning all spoils to the hole. The shot holes will be backfilled with the cuttings generated during the drilling of the shot hole to prevent the energy escaping to the surface. The source charges are placed in a straight line and will be spaced 370-feet apart. Source lines will be run in a North-South direction and be spaced 1,485 feet apart. A maximum of 4,930 shot holes will be drilled resulting in a drilling disturbance of 0.01 acre.

NordAq will not place source charges in water or in established buffer zones. Receivers will not be placed on flowing/open rivers or streams, but may be placed on frozen lakes where land-fast ice is thick enough to support crews on foot. Each hole will take approximately one hour to drill, set the charge, and backfill. If NordAq employs four drilling units simultaneously, approximately 60 holes could be drilled in one day. The project will likely use 4 to 6 drilling units with one spare on standby.

Safe distances for source charge set-backs from sensitive objects have been provided by the Service (USFWS 2012) and the International Association of Geophysical Contractors (IAGC 2001) and the Alaska Department of Fish and Game (ADFG, 1991).

The Service provided NordAq with sample seismic survey stipulations that may be imposed on this survey via the Special Use Permit, anticipated to be issued by the Service (USFWS 2012). These stipulations will be tailored to the project and are thus subject to change from the time of this submittal.

4.3 Data Acquisition and Recording

The seismic survey will be conducted over a continuous period up to three months. Survey crews will be deployed to the survey area via helicopter and existing roads or trails. Receiver node batteries will be charged and stationed in portable charging trailers located at the off-Refuge staging location. The recording nodes will be hand loaded into sling bags and heliported to

awaiting survey crews. The receiver nodes will be placed on the surface by crews on foot and assisted by the helicopters. Helicopters will lower and hoist receiver and source equipment. Following drilling and installation of source charges and placement of receiver nodes, source charges would be detonated one at a time. The reflective energy waves will be recorded by the nodes and stored for later upload at the recording shack. Following a period of data acquisition over a portion of the survey area, crews will retrieve the receivers and redeploy them over the next portion of the survey area. As necessary, the recording shack will be moved by helicopter through the central portion of the survey area, which will likely involve about three locations.

4.4 Survey Completion, Inspection, Monitoring and Restoration

All survey access will be by helicopter with no surface disturbance. All operations will be on frozen surfaces with cribbing to protect the underlying vegetative matt and under frozen conditions. Following acquisition of the data and retrieval of the equipment, the entire survey area will be inspected during daylight hours by helicopter for wooden survey lathe, lost gear, and debris. Crews will also identify any damaged land or property in need of restoration efforts. A small percentage of holes may blow deminimus amounts of material to the surface and these locations will be mapped and revisited and repaired during the post-survey inspection and cleanup. Restoration of damaged surface locations or property will be reported to Service and the State. Restoration will be completed to the requirements of the respective land owner or surface land managers. NordAq or their contractor will oversee the restoration of any damaged surface locations within the survey area. Cleared locations will be allowed to re-vegetate naturally with no active revegetation effort to reduce the opportunity for invasive plants to become established at the sites. A small percentage of source charges may not detonate. These source locations will be mapped, and a crew will plug the holes during the survey inspection and cleanup. The procedure to plug holes with non-detonated charges is as follows:

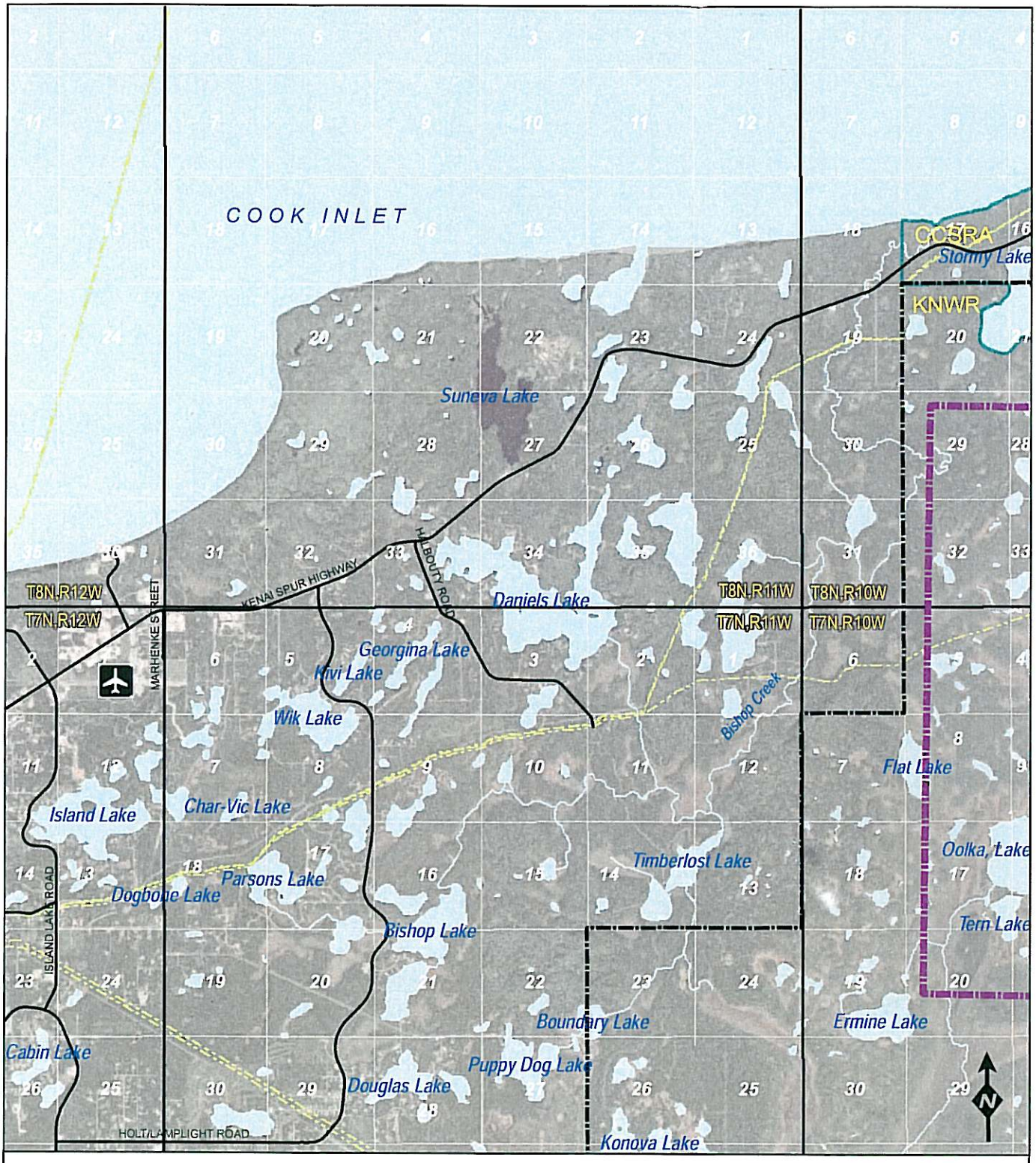
- Locate undetonated source location with GPS unit.
- Pull blast cap lead wires out of the hole.
- Rake soil into (4-inch diameter) hole location, heel-in to re-vegetate naturally.
- The surface area of the hole is left to re-vegetate naturally, unless otherwise directed by the respective landowner.
- File location with landowner and mineral estate owner.

The charge is biodegradable and will degrade when exposed to moisture in 12 to 14 months.

5. Location of Staging Area/Access

Source charge material (explosives), drills, helicopters, road vehicles, and fuel will all be stored on a parcel of private land located outside the Refuge, near the survey area. Equipment and operations also will be staged from here. The intended parcel is in Section 18, T.8N, R.10W, Seward Meridian. This location meets the 27 CFR §555.218 (ATF 2006) required set-back distances for stored explosives. The area will be fenced and have 24-hour security. Alternate staging locations are under consideration will and all meet fuel and explosive storage requirements, for example, the Rediske Air property located at a nearby Nikiski airstrip (Figure 3).

NordAq does not anticipate the use of tracked vehicles to access the survey area. Access to the survey area will be by truck on existing roads, foot trails, and helicopter. Snow machines will be used when the general use is allowed by the respective land managers. Up to 12 snow machines may be used to pack snow and support overland movement of personnel.



Roads
Existing Pipelines
Airstrip
Program Area
Kenai National Wildlife Refuge
Captain Cook State Recreation Area

SCALE:
0 0.5 1 2 Mi
0 0.5 1 2 Km

Projection: State Plane Alaska Zone 4 (feet), NAD83
Seward Meridian

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NORDAQ SHADURA 3D SEISMIC SURVEY
PLAN OF OPERATIONS

REDISKE AIR PROPERTY - DRAFT

FIGURE: 3

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6. Fuel Handling and Storage

Fuel (aviation gas and diesel) will be stored in containment that meets the requirements of 40 CFR 112 criteria for fuel storage. A staging area or an equivalent facility will be used to store fuel for land vehicles. Fuel to support all other operations and vehicles will be stored on private land at existing commercial vendors' shops in the Nikiski area or an equivalent staging facility. Alternative fuel storage locations may also be identified to save costs, reduce air emissions, and reduce the logistical complexity of the survey. The drilling units have 10-gallon tanks and the associated compressors have 20-gallon tanks. The drill and compressor units are completely self-contained with all fuel, magazines, and drill rods on board.

A trailer/truck will be located at the staging area at all times. There will be a 300-gallon heliportable fuel container (fly tank) to carry fuel to the rigs when they cannot be refueled outside the Refuge. The drilling units and associated compressors will be refueled daily at the drill staging area or in the field, when necessary. Standard Operating Procedures (SOP) for refueling will be strictly observed . During fuel transfers, secondary containment or a surface liner will be placed under all inlet and outlet points, hose connections, and hose ends on containers or vehicle fuel tanks. Appropriate spill response equipment, sufficient to respond to a spill of up to five gallons, will be on hand during any transfer or handling of fuel and trained personnel will closely monitor transfer operations at all times. NordAq has provided helicopter seismic SOPs to support this application .

Refueling the drilling units at locations off-Refuge would increase the duration of the survey and its effects. Refueling four to six units a day off-Refuge would increase the number of helicopter lift trips and the additional transport time would lengthen the total duration of the survey. Increased trips per day will result in an increase in helicopter-related effects, such as noise and disturbance to people and animals.

7. Waste Management & Spill Response

All necessary steps will be taken to maintain clean work areas, particularly with regard to food and food associated waste. Because the survey operations will not require a field camp, the potential for attracting animals to the job site is reduced. Waste from operations will be reduced, reused, or recycled to the maximum extent practicable. Garbage and domestic combustibles will be disposed of at an approved site in accordance with 18 AAC 60 (Alaska solid waste management regulations). Any hazardous waste will be handled and disposed of according to Alaska regulation (18 AAC 62).

All equipment maintenance will be conducted out of the survey area. During equipment storage or maintenance, the ground will be protected from leaking or dripping fluids by placing drip pans or surface liners under the equipment. Alternatively, an area may be created for storage or maintenance by using an impermeable liner or other suitable containment mechanism.

8. Health, Safety and Environmental Training

A health, safety and environmental plan will be developed and implemented for all aspects of the proposed project. All personnel will attend a safety meeting every morning before leaving for the survey area. At this meeting, field personnel will be briefed on safety issues, logistics, current weather, and road conditions.

NordAq has prepared a Bear/Wildlife Interaction Plan to minimize potential conflict and interaction with large wildlife (moose), black and brown bears while conducting operations in the area (Attachment A). Crews will receive bear/wildlife awareness training (include all large wildlife). NordAq will employ bear guards for the protection of its seismic crews. NordAq will also consult with the Service and ADF&G to identify the locations of known bear den sites that are occupied in the season of proposed activities. If a crew member encounters an occupied den not previously identified by the Service or ADF&G, NordAq will report it to the ADF&G, Division of Wildlife Conservation and the Service, within 24 hours of its discovery.

9. Community Outreach and Local Hire

Written permission to access private surface land necessary to conduct the survey will be obtained from all property owners. Private lands other than Refuge lands are owned by CIRI, the State of Alaska and the Kenai Peninsula Borough.

10. Historic and Cultural Resources

In accordance with the Archeological Resources Protection Act (16 USC 470aa), the disturbance of archeological or historical sites and the removal of artifacts is prohibited. The excavation, disturbance, collection, or purchase of historical, recent, ethnological, or archeological specimens or artifacts are prohibited. If historic properties are encountered during project activities, work will stop and the Refuge Manager and State Historic Preservation Office (SHPO) will be contacted.

11. Equipment List

Description	Quantity	Purpose
F-350 4x4 Pick-up trucks	2	Off-Refuge on existing road system for Access and Monitoring
F-350 4x4 Pick-up truck	2	Off-Refuge on existing road system for Pre-Plot Survey support
Single-engine Helicopter	2	Survey Support
GPS surveying instruments	-	Pre-Plot Survey support
Heliportable drilling units manufactured by Clean Harbors	4-6 and 1 spare	Shot-Hole Drilling
National Compressed Air compressors	6	Shot-Hole Drilling
Bell 205UH1B Helicopter	1	Shot-Hole Drilling support
Autoseis HDR Nodal recording boxes (cable free)	To Be Determined	Data Recording
SG-10 geophones with snow plates	6 per group	Data Recording-Off Refuge
Recording Trailers	1	Data Recording-Off Refuge
International 4700 crew cab diesel truck with 400-gallon diesel tank for refueling F350 4x4 pick-up trucks	1	Data Recording
Spill Response Kit	1	Emergency Spill Response
Snow machines*	12	Pack snow

* If KNWR is open to snow machine travel.

12. References

ADFG 1991. Blasting Standards for the Protection of Fish, Alaska Department of Fish and Game, February 15, 1991.

ATF 1996. Table of distances for storing explosive materials, United States Federal Code, 27 CFR § 555.218.

IAGC 2001. Table 2, IAGC Recommended Guidelines: Energy Source Operating Distance Chart, International Association of Geophysical Contractors, 2001.

USFWS 2012. Winter Seismic Survey, Special Conditions, Kenai National Wildlife Refuge. Received September, 2012.

NORDAQ ENERGY, INC.

"KNOWLEDGE AND VISION FOR ALASKA"

— Appendix A —

NordAq Energy, Inc.
Bear/Wildlife Interaction Plan

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Wildlife Interaction and Avoidance and Bear Avoidance Plan

Shadura Natural Gas Development and Seismic Survey Projects

NordAq Energy, Inc
3000 A Street, Suite 410
Anchorage, Alaska 99503

September 2012

Contents

Tables

1 INTRODUCTION AND PROJECT SUMMARY

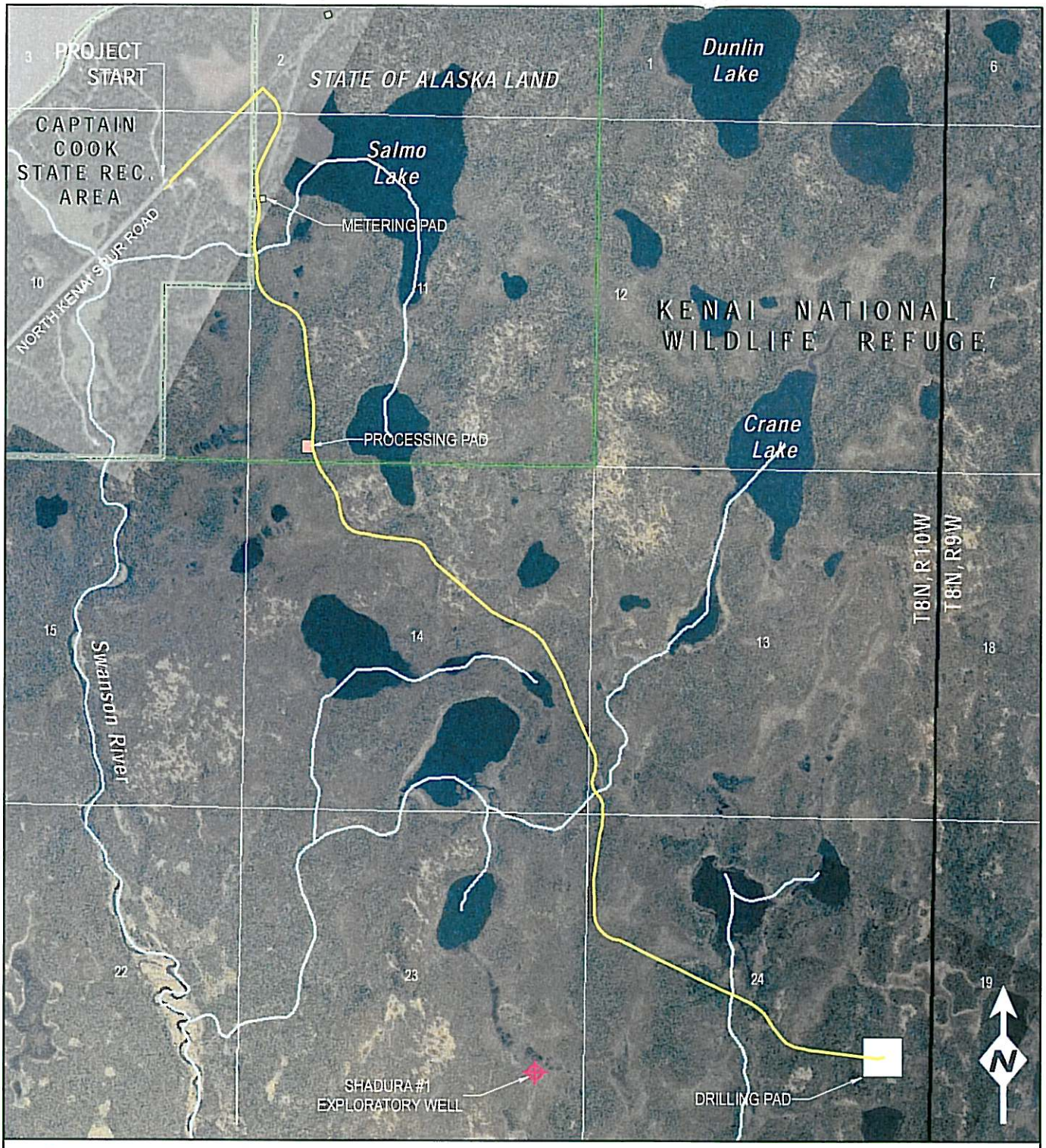
NordAq Energy, Inc. (NordAq), an Anchorage-based independent oil company with offices in Alaska, proposes to conduct a 3 dimensional (3D) seismic and an exploratory drilling program in the Kenai National Wildlife Refuge (KNWR). The proposed projects would be conducted on State of Alaska (State) lands as well as KNWR administered lands that are underlain by Cook Inlet Region, inc (CIRI) oil, gas and coal estates. NordAq has leased a portion of this oil and gas estate from CIRI with the intent to drill and produce natural gas.

NordAq's Shadura Natural Gas Development project (Development project) will include the infrastructure reasonably necessary to produce known natural gas reserves from NordAq's leases and transport that gas to market via an existing pipeline.

NordAq is also proposing to undertake a 3D seismic acquisition program on the Kenai Peninsula in the northern portion of the KNWR during the winter months of 2012-13. The proposed survey area is located west of the Swanson River Oil and Gas Unit and east of the Cook Inlet coastline. The purpose of the survey is to image the sub-surface rock strata of the Shadura geologic discovery to help in planning for exploration and development of the CIRI mineral estate leased to NordAq.

The entire survey will be supported from a staging area outside of the KNWR and will use heliportable drilling units and autonomous (cable-free) receivers. Heliportable seismic survey methods are used commonly in remote areas with difficult terrain and will provide for minimal intrusion on the surveyed landscape.

The following plan has been developed to help ensure the conservation of wildlife resources and the protection and safety of project personnel. This document, along with field training, provides field crews and construction personnel with an understanding of the importance of wildlife conservation and safety precautions to prevent injury to wildlife or humans.



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SHADURA NATURAL GAS DEVELOPMENT PROJECT

LOCATION

FIGURE: 1

ARCADIS: NOREIS0120.mxd, 09/21/12, R00

2 WILDLIFE IN PROJECT AREA

Information in this plan is from the following sources:

- *Final Finding of the Director. Cook Inlet Areawide 1999 Oil and Gas Lease Sale.* ADNR/DOG, January 20, 1999
- *Supplement to Cook Inlet Areawide Oil and Gas Lease Best Interest Finding. Shorebirds.* ADNR/DOG. May 20, 2000.
- *National Bald Eagle Management Guidelines*. USFWS, May 2007. (http://www.fws.gov/pacific/eagle/NationalBaldEagleManagementGuidelines.pdf)
- *Conservation Assessment for Trumpeter Swan (Cygnus buccinators).* USDA Forest Service, Eastern Region, December 18, 2002
- Armstrong, *R*.H. (1995) *Guide to the Birds of Alaska.* 4th Edition. D. Graydon, Anchorage and Portland: Alaska Northwest Books 324pp.
- Sibley, D. A. (2003). *The Sibley Guide to the Birds of Western North America*. A. A. Knopf, New York, NY: Knopf Publishing Group. 474pp.
- *The Birds of North America* Online. Cornel Lab of Ornithology, 2010
- Summer 2012 field surveying activities undertaken by Arcadis staff in conjunction with the Shadura Natural Gas Environmental Impact Statement (EIS) development.

NordAq has confirmed that no endangered or threatened wildlife, as listed on the U.S. Fish and Wildlife Service's (USFWS) endangered list, is present within the project area.

Wildlife is abundant in the Kenai Peninsula during the summer in the project area, however, many of these animals leave during early fall, moving to follow food, migrating to wintering grounds or hibernating during winter. Habitat in the project area consists of wetlands and intermediate stage - predominantly black spruce forest. No marine wildlife will be encountered through the Development project. While many of the wildlife noted below will be absent from the study area during the winter months, when NordAq would undertake its 3D Seismic surveying operations, during the Development project timeframe, the following wildlife may be encountered:

2.1 Birds

All hawks, owls, falcons, eagles and ravens are protected by federal law under the Migratory Bird Treaty Act (MBTA) of 1918. Bald Eagles (*Haliaeetus leucocephalus*) and Golden Eagles (*Aquila chrysaetos*) are also protected by federal law under the Bald and Golden Eagle Protection Act (BGEPA) of 1940. Both the MBTA and BGEPA are administered by the USFWS.[1] The MBTA offers protection to over one thousand species of migratory birds,

[1] The MBTA makes it unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not.

The BGEPA is specific to Bald and Golden Eagles and imposes criminal and civil penalties on anyone (including associations, partnerships and corporations) in the United States (U.S.) or within its jurisdiction who, unless excepted, takes,

including waterfowl, shorebirds, seabirds, wading birds, raptors and passerines. The list of these birds is presented on the USFWS's Migratory Bird Program website (http://www.fws.gov/migratorybirds/RegulationsPolicies/mbta/mbtandx.html).

Table 1 Birds of Prey with the Potential to Occur in the Study Area, Seasonal Presence in the Project Area, Nesting Habitat Descriptions and Preferences and Nest Encounter Potential

Common Name	Scientific Name	Seasonal Presence in Project Area[1]	Nesting Habitat Description	Nest Observation Potential – Yes or No
American Kestrel	*Falco sparverius*	Rare	Tree cavities	No
Bald Eagle*	*Haliaeetus leucocephalus*	Year-Round	Prominent trees near water feature where prey is abundant	Yes
Boreal Owl	*Aegolius funereus*	Year-Round	Tree cavities in mixed coniferous and deciduous woodlands	No
Common Raven	*Corvus corax*	Year-Round	Various habitats, including cliffs, rocky outcrops, open and forested habitats	No
Golden Eagle*	*Aquila chrysaetos*	Summer	Cliff ledges. Less often in prominent trees	No
Great Gray Owl*	*Strix nebulosa*	Year-Round	Tree tops in boreal forests	No
Great Horned Owl*	*Bubo virginianus*	Year-Round	Tree tops in woodland areas; roosts during the day in trees and on sheltered cliff ledges	No
Gyrfalcon	*Falco rusticolus*	Year-Round	Cliff ledges	No
Red-tailed Hawk*	*Buteo jamaicensis harlani*	Summer	Tall trees with open feeding areas nearby	Yes
Merlin*	*Falco columbarius*	Summer	Trees in forest with open areas	Yes
Northern Goshawk	*Accipiter gentilis*	Year-Round	Tall trees in varied forest types, especially mature forests	No
Northern Harrier	*Circus cyaneus*	Summer	Ground in fields, marshes, or open areas in or near woodlands	Yes
Northern Hawk Owl	*Curnia ulula*	Year-Round	Tree cavities in open spruce woods and around bogs or burned areas	Yes
Osprey*	*Pandion haliaetus*	Summer	Dead trees or other prominent trees with support near water feature	No
Peregrine Falcon*	*Falco peregrines*	Year-Round	Cliff ledges	No
Rough-legged Hawk	*Buteo lagopus*	Summer	Cliff ledges	No
Sharp-shinned Hawk	*Accipiter striatus*	Summer	Trees in mature mixed forests and coniferous woodlands	No

[1]As defined by Armstrong 1995, Sibley 2003

*Featured Species in the Alaska Department of Fish and Game's Wildlife Action Plan

possesses, sells, purchases, barters, offers to sell or purchase or barter, transports, exports or imports at any time or in any manner a bald or golden eagle, alive or dead; or any part, nest or egg of these eagles; or violates any permit or regulations issued under the Act.

Interfering with avian wildlife is against NordAq's company policy. Company personnel and contractors will follow these rules.

- *Never feed, approach or harass any avian wildlife.*
- *All vehicle traffic must remain on established roadways*
- *All vehicle traffic will follow posted speed limits.*
- *All encounters with avian wildlife will be reported to NordAq's on site supervisor*

During the summer 2012 field investigation undertaken in support of the Shadura EIS, five occupied and seven unoccupied raptor nests were identified in areas surrounding the project area (Figure 2). The majority of raptor nests were located in mature spruce and cottonwood trees adjacent to the Swanson River, Hungry Lake and Shadura Lake.

2.1.1 Bald Eagle and Raptor Nest Disturbance Avoidance

To avoid disturbing any Bald Eagle nests or nesting activities, NordAq will:

- Keep a distance between the activity and the nest (distance buffers). The buffer areas serve to minimize visual and auditory impacts associated with human activities near nest sites. Buffers will be large enough to protect existing nest trees and provide for alternative or replacement nest trees.
    - Maintain a buffer of at least 330 feet (100 meters) between project activities and the nest (including active and alternate nests). If such a buffer distance is not capable of being maintained and activity is required to be closer than 330 feet, NordAq will maintain as large a distance buffer as possible.
    - Restrict all clearing, external construction, and landscaping activities within 660 feet of the nest to **outside the nesting season** (the nesting season for Bald Eagles and other area raptors is from April to mid-August).
- Maintain preferably forested (or natural) areas between the activity and around nest trees (landscape buffers), and
- Avoid certain activities during the breeding season.
- Not intentionally feed Bald Eagles or raptors. Artificially feeding these birds can disrupt their essential behavioral patterns and put them at increased risk from power lines, collision with windows and cars, and other mortality factors.

2.1.2 Other Birds – Swans

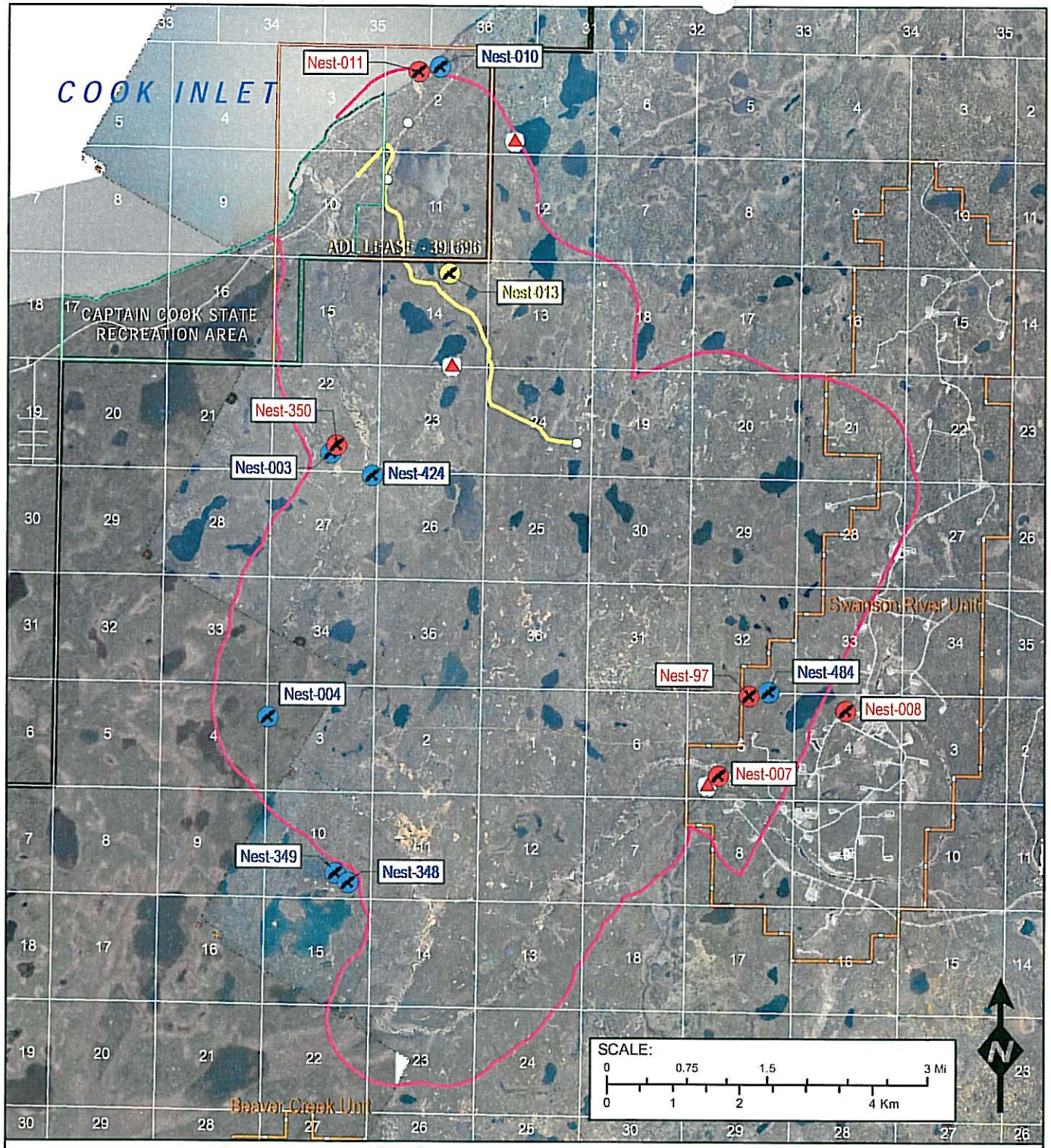
During the summer 2012 field investigations undertaken to support the Shadura EIS, swan nesting sites were identified in areas surrounding the Development project area (Figure 2). As the nest locations were made with the use of a helicopter, is was not viable to navigate closer to determine the exact species of swan that may occupy the nests. While Trumpeter Swans (*Cygnus buccinator*) and Tundra Swans (*Cygnus columbianus*) can be within the KNWR area, it

is undetermined at this time, the exact swan species noted during the 2012 field investigations. As such, except where noted otherwise, NordAq will refer to any such nests as 'swan' nests.

Trumpeter swans are protected by federal law under the MBTA and will comply with all of its requirements.

To avoid disturbing any swan nests or nesting activities, NordAq will:

- Keep a distance between the activity and the nest (distance buffers). The buffer areas serve to minimize visual and auditory impacts associated with human activities near nest sites. Buffers will be large enough to protect existing nest trees and provide for alternative or replacement nest trees.
    - Maintain a buffer of at least 300 feet between project activities and the nest (including active and alternate nests). If such a buffer distance is not capable of being maintained and activity is required to be closer than 300 feet, NordAq will maintain as large a distance buffer as possible.
    - Restrict all clearing, external construction, and landscaping activities within 600 feet of the nest to **outside the nesting season** (the nesting season for trumpeter swans is typically from late April to mid June).
- Maintain preferably forested (or natural) areas between the activity and around nest trees (landscape buffers), and
- Avoid certain activities during the breeding season.
- Not intentionally feed any swans. Artificially feeding swans can disrupt their essential behavioral patterns and put them at increased risk human activity related mortality factors.



Identified Raptor Nests
- Active
- Inactive
- Inactive-Abandoned

Swan Locations

Raptor Study Area
Pads
Kenai National Wildlife Refuge
Captain Cook SRA

ADL Lease 391596
Oil & Gas Unit Boundaries
Wilderness Area
Roads

Access Road

Projection: State Plane Alaska Zone 4 (feet), NAD83
Seward Meridian

NORDAQ ENERGY INC.
KNOWLEDGE AND VISION FOR ALASKA

ALASKA
Project Location

2012 AERIAL RAPTOR SURVEY
NORDAQ SHADURA NATURAL GAS DEVELOPMENT PROJECT

STUDY AREA AND NEST LOCATIONS

FIGURE: 2

ARCADIS NOREIS0125.mxd, 09/26/12, R00

2.2 Terrestrial Mammals

NordAq recognizes that the proposed projects are located in areas of potential wildlife use. NordAq recognized that many mammals are protected by federal or state regulations and will comply with all applicable regulations. Should advice be sought regarding these regulations, NordAq will contact the applicable agency listed in Section 3 of this document.

2.2.1 Bears

Brown (grizzly) bears (*Ursus arctos*) and black bears (*Ursus americanus*) are concentrated around the Swanson River in late summer and fall, but both species are not likely to be active during winter portions of the project. Nonetheless, habitats such as den sites must not be either disturbed or created. NordAq will work with Alaska Division of Fish & Game to identify dens in the project area. Dens will be avoided to the greatest extent possible.

2.2.2 Moose

Moose (*Alces alces*) are large ungulates that usually have very limited energy reserves during winter and may move quite slowly. They are likely to seek hard surfaces such as prepared roadways for travel. These conditions coupled with winter darkness increase the likelihood of animal-vehicle collisions. Moose browse will not be created or disturbed as part of this project.

2.2.3 Other Terrestrial Mammals

Other mammals include coyote (*Canis latrans incolatus*), red fox (*Vulpes vulpes*), wolf (*Canis lupus*), lynx (*Lynx Canadensis*), mink (*Mustela vison*), river otter (*Lutra Canadensis*), snowshoe hare (*Lepus americanus*), porcupine (*Erethizon dorsatum*), Kenai wolverine (*Gulo gulo katschemakensis*) marten (*Martes Americana*), muskrat (*Ondatra zibethhicus*), weasel (*Mustela ermine*), beaver (*Castor Canadensis*), Alaska marmot (*Marmota broweri*), and Kenai red squirrel (*Tamiasciurus hudsonicu kenaiensis*),

NordAq has confirmed that the Development project does not occur within the Kenai Lowlands Caribou herd core summer habitat.

2.3 Terrestrial Mammal Interactions

Interfering with terrestrial wildlife is against NordAq's company policy. Company personnel and contractors will follow these rules.

- *Never feed, approach or harass any wildlife.*
- *All vehicle traffic must remain on established roadways*
- *All vehicles traffic will follow posted speed limits*
- *All visual citing of or encounters with terrestrial mammals will be reported to NordAq's on-site supervisor*

- *Bear guards will be provided to survey crews and those staff who will be working in isolated regions of the project area. Bear guards will not be provided for personnel involved in drilling operations.*

2.3.1 Vehicle safety

- All vehicle traffic will follow posted speed limits
- Personnel will be made aware for the potential of moose-vehicle collisions on the Kenai Spur Highway and gravel roads
- Work sites will be designed with sufficient visibility
- Personnel will travel to the work site in crew vehicles or in as few vehicles as needed to eliminate the probability of vehicle-wildlife interaction

2.3.2 Waste management

The biggest impact of human activities on bears and other wildlife is caused by poor waste handling practices. Bears are constantly searching for food and they have learned, in some areas of the Kenai Peninsula, to associate human activity (including oil and gas facilities) as a reliable food source. Garbage dumps and dumpsters, in particular, have become major attractants for bears. Proper food waste management is critical to ensuring bears and other wildlife does not become conditioned to associate NordAq's activity with a food source.

When bears emerge from dens (April/May) they start foraging for food. Extra care is necessary to keep food waste properly stored and disposed of so that bears cannot gain access. If the bears do not find food at project locations, they typically will avoid human activities. All waste will be stored in secured bear-proof dumpsters before being backhauled for offsite disposal on a regular basis.

Work locations will be illuminated in the immediate work areas to maintain safe visibility at all times. Personnel will be reminded to be extra cautious when working and to remain within the lighted work areas, avoid drifts around the pad perimeter, and always perform a 360-degree visual sweep and peer around corners before exiting facilities.

NordAq's waste management plan includes:

- Segregating food waste from burnable dumpsters and prohibiting storing food waste in dumpsters and vehicles that are not secure.
- Only use designated receptacles for food waste inside facilities or those that are secure from wildlife access.
- Placing dumpsters in a section of the pad with good visibility and lighting and away from high traffic areas
- Provide designated waste containers for any hazardous or poisonous materials that may be generated by NordAq's operations. NordAq will ensure that these containers are stored in such a manner as to prevent leaks and spills,
- Backhaul food waste to approved dumpsters,

- Prohibiting littering of all kind on or near any NordAq location
- Revisiting NordAq's project area following decommission of the facilities to clean up any debris.

2.4 Wildlife Avoidance and Interaction Training

2.4.1 Bear Den Avoidance

Project activities will avoid known brown bear (grizzly bear), and black bear dens by ½ mile during construction activities.

Any bear den identified during field operations will result in additional communications with ADF&G.

2.4.2 Other Den Site Avoidance

Project personnel will actively avoid any known or witnessed denning sites of wildlife within the project area. Personnel will immediately report the location of any witnessed denning site to NordAq's on-site representative.

2.4.3 Moose Avoidance

During winter months, moose have limited energy reserves and may move quite slow. During summer months when moose have abundant food sources and high energy reserves, they are able to move quickly and cover large sections of terrain in small amounts of time. Cows with their young are particularly easily agitated and have been known to charge persons that it considers are a threat or that get too close. Moose citings will be reported to NordAq's on-site representative and if possible alternative working arrangements made until any moose have moved out of the working area.

2.4.4 Training Topics

Nordaq's mandatory environmental pre-spud and pre-construction training program will include bear awareness, watching the "Working in Bear Country" DVD (a copy will be maintained on site) and reading/signing off on this Bear Avoidance Plan (copy also kept on site). Wildlife Awareness also will be reinforced by inclusion as a topic in daily safety meetings. For training purposes at various employee meetings, the following items will be addressed.

Food waste management

- The single biggest influence an individual can make is to handle food waste correctly.
- Eliminate associations of food sources with facilities and vehicles.
- Dispose of food waste in bear-proof dumpsters and backhaul on a regular basis for disposal offsite.

Site safety and communication

- Make sure personnel are adequately trained to operate radios or other communications equipment.
- Provide training through various means, including new employee orientation, safety meetings, and tailgate discussions.
- Contact the HSE advisor for recent sighting information. HSE advisor will maintain a file of bear / wildlife observation reports and post notices at project sites.
- Recognize signs of wildlife presence (moose / bear droppings, territorial marking) etc.
- Report any bear / wildlife sightings immediately to the NordAq onsite representative and HSE advisor, preferably before the bear enters the exploration pad or staging area.
- Use the buddy system during outside jobs and designate a bear / wildlife lookout.
- Make loud noises before walking into any areas with poor visibility.
- Work with other operations being conducted simultaneously if possible to insure each operation's actions are compatible with providing protection from and avoidance of bears or other wildlife.

2.4.5 Being Aware of "At-Risk" Locations and Activities

Specific locations and/or activities lead to increased human-bear interaction. These are described below and will be reinforced by inclusion into NordAq's Development project training program.

<u>At-Risk Locations</u>

- Remote work sites such as surveying locations and water withdrawal locations.
- NordAq facilities that have low activity levels (i.e. not monitored 24 hr/day).

<u>At-Risk Activities</u>

- All night-time activities.
- Surveying.
- Operating heavy equipment during construction and maintenance of service road and turnouts.
- Working as a laborer to support gravel road construction and maintenance, and during cleanup activities.
- Spring clean-up activities.

3 REPORTING AND PRIMARY COMMUNICATIONS

In the event that advice is required in dealing with a wildlife incident, the individuals listed below will be contacted immediately.

Jeff Selinger
ADF&G/DWC-Wildlife Soldotna
43961 Kalifornsky Beach Road, Suite B
Soldotna, AK 99669-8276
Phone: (907) 260-2905
Jeff.selinger@alaska.gov

Larry Lewis
ADF&G/DWC-Wildlife Soldotna
43961 Kalifornsky Beach Road, Suite B
Soldotna, AK 99669-8276
Phone: (907) 262-2931
Larry.lewis@alaska.gov

Russell M. Oates, Chief of USFWS Migratory Bird Management
1011 East Tudor Road
Anchorage, Alaska 99503
Phone: 907-786-3443
1-800-368-8890
Fax: 907-786-3641
E-mail: ak_mbm@fws.gov

Kenai USFWS Field Office
43655 Kalifornsky Beach Road
Soldotna Alaska 99669
Telephone: 907 262-9863
Fax: 907 262-7145

Any vehicle-animal collisions or strange animal behavior will be reported to the NordAq HSE advisor. Any wildlife mortalities should be reported to the ADF&G or USFWS contacts above, for mammals or birds, respectively. Because carcasses may attract bears or foxes, local officials will be contacted regarding salvage and/or disposal of the carcass.

Permit #_____
OFFICIAL USE ONLY

(rev 4/6/99)

STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL AND GAS

GEOPHYSICAL EXPLORATION PERMIT

Applicant/Permittee: NordAq Energy, Inc. c/o Glenn Ruckhaus V.P. Contracts and Permitting
Address: 3000 A Street, Suite 400
Anchorage, Alaska 99503
Phone: 907-646-9315
Fax: 907-646-9317

Contractor: TBD
Phone: _____
Fax: _____

Contact: Brian Havelock, ARCADIS-US
Title: Project Scientist
Address: 420 L Street
Anchorage, Alaska 99501
Phone: 907-277-3713
Fax: 907-277-3776

General Location: Kenai Peninsula Borough, Kenai National Wildlife Refuge and adjacent state land covering Townships 7 and 8 North and Ranges 9 and 10 West, Seward Meridian

Period Requested: From: November 1, 2012 **To:** April 30, 2013

Geophysical Technique: Seismic (complete below) ___ Other (attached description)

A) Marine: Vessel Name: _____
Registered Owner: _____
Official Number: _____
Radio Call Number: _____
Airguns: Total cubic inches (ci) in array: _____
Maximum Operating Pressure: _____
Minimum Water Depth: _____
Streamer Length: _____
Other Energy Source: _____ (attach description)

B) Uplands: ____Vibroseis: ____Track Mounted ____Wheel Mounted
X Shallow Hole: Hole Depths 25 feet
____Surface Shot: Charge Heights _____
Explosives: Type: 1 kg. explosive charge
Lbs/Shot/Hole: 2.2 Distance Between Charges 370 feet
Number of Helicopters 2 Fixed Wing Aircraft 0

C) Number of line miles (2D) _____ and/or square miles (3D) to be acquired: 48

D) Line Location Map: The applicant is required to submit a map(s) showing the exact location of all proposed seismic lines. The applicant may request that this map be maintained confidential as provided in AS 38.05.035(a)(8). Do you request confidentiality? Yes X No —

Housing for Project Personnel:

A) Housing type: ____ Existing Facilities Located outside of survey area in Nikiski-Kenai industrial area
____ Temporary Camp, please describe _____
_____

B) Number of Personnel: 60 to 80

C) Drinking Water Supply: Purchased potable water (water bottles)

D) Disposal of Solid Wastes: Garbage and domestic combustibles would be disposed of at an approved site in accordance with 18 AAC 60

E) Disposal of Liquid Wastes: There will be no liquid waste generated from the survey

Fuel Storage:

A) Type of Fuel: Diesel and Aviation Gas Amount Stored TBD

C) Method of Storage/Containment: Tanks and containment that meets the requirements of 40 CFR 112

D) Location of Stored Fuel: Fuel t would be stored on private land at existing commercial vendors' shops in the Nikiski area or an equivalent facility.

Surface Travel:

A) The applicant must provide a list of all surface contact vehicles to be used.

B) Will use of this equipment require clearing of vegetation? X if yes, describe method and amount of clearing required. NordAq anticipates 10-20 percent of the sources over the entire survey area will require clearing for the heli portable drills. There will be no clearing in sparsely treed and treeless areas. . Portable drills and crews will be deployed by helicopter and crews will be deployed to operate the drills and deploy and retrieve the receiver nodes.

C) Will river crossings be required? No if yes, list major drainages. _____

Indemnity: Amount: $500,000 Bond ID Number #9422389560

Bonding Company: Wells Fargo Bank Type: X Statewide Bond

Address: 1500 W Benson Blvd. Anchorage AK 99502 ___ Single Program

The applicant agrees that operations shall be conducted in conformance with applicable Federal, State and local laws and regulations now, or hereafter, in effect during the life the permit. The applicant agrees that operations shall be conducted in strict compliance with the provisions of the Alaska Miscellaneous Land Use Regulations, and permit stipulations.

The applicant certifies that he has read and is familiar with the Alaska Miscellaneous Land Use Regulations.

Signature: _____ Date 10/9/2012

Print Name Glenn Ruckhaus

Title VP Contracts and Perm. Hing

DO NOT WRITE BELOW THIS LINE

LAND USE PERMIT

The DIVISION OF OIL AND GAS grants to _____ the right to use State of Alaska lands, as described in this application, subject to 11 AAC 96.010 thru 96.250, Miscellaneous Land Use Regulations, and the attached stipulations.

Effective dates for permit: _____ to _____

STATE OF ALASKA

BY: _____ Date _____

TITLE: _____